

Section I (The Claims)

1. (Previously Presented) A process for the separation of metals, said metals comprising metal oxides in a mixed oxide sample, the process comprising:

- (i) adding the mixed oxide to a molten salt electrolyte and cathodically electrolyzing the oxide, the potential of the cathode being controlled so as to favour oxygen ionisation over deposition of metal from the cations present in the molten salt, and the applied potential difference being such as to facilitate selective reduction of one metal oxide at the expense of other metal oxides; and
- (ii) separating the metal from the remaining metal oxides

wherein said metal oxides comprise oxides of metals from at least one of the transition metal, lanthanide or actinide series.

2. (Previously Presented) The process of claim 1 wherein said mixed oxide sample comprises a mixture of two or more metal oxides.

3. (Previously Presented) The process of claim 1 wherein said metals comprise zirconium and hafnium and said mixed oxide sample comprises mixed zirconium and hafnium oxides.

4. (Previously Presented) The process of claim 1 wherein the mixed oxide is provided as solid pieces of irregular size and shape, a powder, an amorphous mass, or a dense solid agglomerate.

5. (Previously Presented) The process of claim 1 wherein the oxide is located in a mesh basket which forms the cathode.

6. (Previously Presented) The process of claim 1 wherein the molten salt electrolyte comprises at least one chloride salt.

7. (Previously Presented) The process of claim 6 wherein the chloride salt is CaCl_2 or BaCl_2 .

8. (Previously Presented) The process of claim 1 wherein the anode is a carbon anode.
9. (Previously Presented) The process of claim 1 wherein the step of separating the metal from the remaining metal oxides is carried out by the use of dissolution and solvent extraction techniques, heating and slagging methods or electrochemical means.
10. (Previously Presented) The process of claim 1 wherein said reduction of the selected metal oxide is carried out in one molten salt whilst separation of the metal from the other metal oxide or oxides is effected in a different molten salt composition.
11. (Previously Presented) The process of claim 1 wherein said reduction of the selected metal oxide and said separation of the metal from the other metal oxide or oxides is performed in the same molten salt.